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General Notes.

GEOLOGY AND PALEONTOLOGY.

Fresh-Water Diatomaceous Deposit from Staked Plains, Texas.—Some nearly white earth, very light in weight, from Crosby County, Texas, and within the Staked Plains region was submitted by Prof. E. D. Cope to the first of the undersigned authors for examination.

In a contribution to the "Vertebrate Paleontology of Texas," page 123 of the Proceedings of the American Philosophical Society, Prof. Cope states that this material is from the Blanco Cañon beds as named by Mr. Cummins in the first annual report of the Geological Survey of Texas, 1890, page 190, and describes it as a "white siliceous friable chalk."

Under the microscope this earth is found to be constituted almost entirely of the siliceous skeletal remains of fresh-water diatoms, probably 90 per cent. of the body of the earth being made up of these minute single celled forms of plant life. The mass was disintegrated and the diatoms separated and cleaned by J. A. Shulze after which the forms were referred to C. Henry Kain for identification which he has done with much care and after consultation with various authorities, both by personal letter and through the medium of their publications.

He reports: "This is a fresh-water fossil deposit. The species contained in it may now be found living in Utah and in the Yellowstone Park. Many of the species are also common to fresh water streams everywhere."

The following number of species, twenty-seven in number, though not exhaustive, is nearly so.

Amphora ovalis Ehr.; *Amphora uncinatum* Ehr.[1]; *Achnanthes ventricosa* Ehr.; *Campylodiscus clypeus* Ehr.[2]; *Cymbella cistula* Hempr.;

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[1] This is doubtless the form which Ehrenberg figures as *Cocconema uncinatum*—see Proc. Roy. Acad. Berlin, 1870, pl. 1 (II) fig. 9. It is however really an *Amphora*.

[2] In a preliminary list furnished by C. H. Kain, and published by Prof. E. D. Cope in the paper before referred to (see page 123) this form is noted as *C. bicostatus*, having been wrongly identified before the cleaning of the material rendered the markings plainly visible.

Cymbella lanceolatum Ehr.; *Denticula valida* Pediceno; *Epithemia gibba* (Ehr.), Kutz; *Epithemia gibba* var. *parallela* Grim; *Epithemia zebra* Ehr., Kutz; *Epithemia gibberula* (Ehr.), Kutz var. *producta* Grim; *Epithemia constricta* Breb; *Encyonema ventricosum* Kutz; *Gomphonema clavatum* Ehr.; *Fragillaria virescens* Ralfs.; *Navicula major* Kutz; *Navicula viridis* Kutz; *Navicula rostrata* Ehr. *forma minor; Navicula bohemica* Ehr.; *Navicula elliptica* var. *minutissum* Grim; *Navicula decurrens; Navicula varians* Greg.; *Navicula brebissonii* Kutz; *Navicula forma* Kutz; *Nitzschia brebissonia* Wsm.; *Nitzschia spectabilis* (Ehr.), Ralfs.; *Surrirella geroltii* var.—LEWIS WOOLMAN AND C. HENRY KAIN.

In the paper previously referred to Prof. Cope notes the occurrence in this diatomaceous stratum of a "Mastodon of the angustidens type" and of a horse allied to the *Equus ocidentalis* of Leidy, and defines the latter as a new species to which he assigns the name *Equus simplicidens;* and indicates by a comparison of Equus and Mastodon fauna that the age of the Blanco Cañon beds is probably intermediate between that of the Equus beds and the Loup Fork beds or the equivalent of the pliocene proper.

In view of this determination of the age of these beds the close correspondence of all the specific forms of diatoms above listed becomes interesting as showing the wide geological range for the forms of these low organisms.

Is Meniscotherium a Member of the Chalicotheriodea?—The description of the complete foot structure of *Meniscotherium* or *Hyracops* by Marsh[1] tends to confirm the supposition I advanced in the NATURALIST of October, 1891. At the time, I stated that the structure of the skull and teeth of *Meniscotherium* pointed to a striking similarity between this Wahsatch genus and the Miocene *Chalicotherium,* but that the question would turn upon the foot structure of the earlier form.

I reproduce here, side by side, for purposes of comparison, the fore and hind feet of *Meniscotherium* (Hyracops) *sociale* Marsh, and of *Chalicotherium,* from the figures of Gervais.

It will be seen at once that both are essentially tridactyl types. In *Meniscotherium* the three middle digits are greatly enlarged while the outer digits I and V are equally reduced in both the manus and pes, indicating that the feet are well established upon the tridactyl basis. Marsh describes the ungual phalanges, as intermediate between hoofs and claws. "Their extremities are thin, somewhat expanded, and more like those of primates than of any other group. They were apparently covered by thin nails." There is no displacement but the

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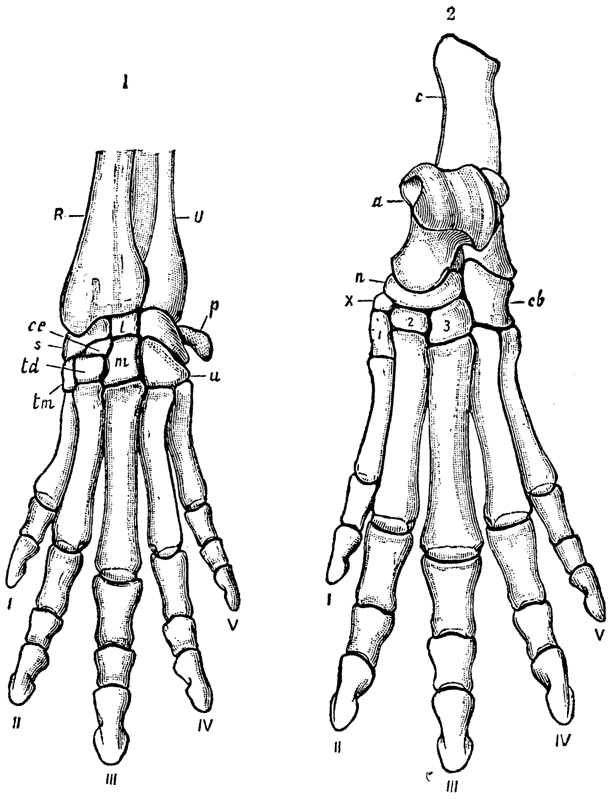
[1] Am. Journ. Science, May, 1892, p. 447.

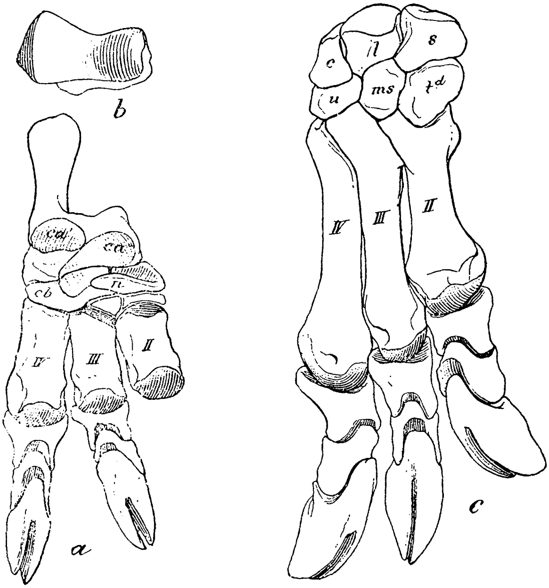


Fore and Hind Feet of Meniscotherium after Marsh.

carpals and tarsals are serial and there does not seem to be even any metapodial displacement. The inference is that *Meniscotherium* was, unlike *Chalicotherium*, a semi-plantigrade.

Many marked differences should also be noted. As I pointed out in comparing the limbs of *Chalicotherium* with those of *Palaeosyops*, the displacement in the former is exactly similar to that in the Perissodactyla. We also note the extremely short neck of the astragalus in *Chalicotherium* as contrasted with the long slender neck of *Meniscotherium*. There is also a great transformation in the claws. Most of these differences may have been bridged over in the long period intervening between the Wahsatch and the Miocene. We find cases of a similar transformation in other lines both in the reduction of the lateral toes and in the displacement. The characters which unite and separate these forms may be summed up as follows:

MENISCOTHERIUM.	CHALICOTHERIUM.
Tridactyl (functionally)	Tridactyl (structurally).
Main axis through third digit	Main axis through fourth digit.
Sub-ungulate	Unguiculate.
Carpals and tarsals serial	Carpals and tarsals displaced as in Perissodactyla.
Centrale and (tibiale)	Wanting.
A fibulo-calcaneal facet	None.
Anterior portion of dental series reduced	Same reduced or wanting.
Superior molar buno-selenodont	Superior molars buno-selenodout.
Metaconid reduplicate	Metaconid reduplicate.
A mesostyle	A mesostyle.



Fore and Hind Feet of Chalicotherium after Gervais.

No third lobe on last lower molar.	No third lobe on last lower molar.
Hypocone and metaconule united in short transverse crest.	Hypocone and metaconule united in a short transverse crest.

Altogether, the resemblances between these two forms are fundamental, the differences are mainly such as separate many lower Eocene from middle Miocene forms. Although no intermediate forms are known, there is a presumption in favor of a genetic relationship. At all events *Meniscotherium* will probably be removed from the Condylarthra, where it has always held an anomalous position and be placed in the Chalicotheriodea.—HENRY F. OSBORN, American Museum of Natural History. May 3rd, 1892.

Geological News.—General.—In a preliminary paper on the Ouachita Mountain System in Indian Territory, Mr. Robt. T. Hill remarks that these mountains should no longer be omitted from our maps, for they constitute the foundation of all later geologic structure in the Texas region, differentiating it from the Kansas-Missouri region in both present and past geologic times back to the earlier Mesozoic epochs, and influencing all the main river courses of Indian Territory whose great southward bends are an adaptation to the strike of this mountain system, the Washita alone having cut through it. (Am. Journ. Sci., Aug., 1891).——**Paleozoic.**—Mr. M. E. Wadsworth announces that the recent observation of the "South Trap Range" east of Lake Gogebic in Michigan shows that both the lava flows, and the eastern sandstone dip at a low angle, are one formation, and are as conformable as eruptions of lava can be with a contemporaneous sedimentary deposit. (Am. Journ. Sci., Nov., 1891).——**Cenozoic.**—A new species of Moa from New Zealand is announced by Mr. Lydekker, *Pachyornis rothchildi.* The species is founded on the right femur and the two tibio-tarsi and tarso-metatarsi figured and described in the Proceeds. London Zool. Soc., Nov., 1891.——The bird-bones collected by Major Forsyth from the Plistocene beds of Corsica and Sardinia have been referred by Mr. Lydekker to the following families: *Stringes, Acciptres, Picariœ, Passeres, Columbœ, Gallinœ,* and *Turbinares.* (Proceeds. Zool. Soc., London, 1891., p. 467).——Mr. R. D. Salisbury records a series of facts which warrant the conclusion that glaciation extended further southward than the hitherto accepted terminal moraine. The character of this extra-morainic drift indicates that it is probably the equivalent of the oldest glacial drift of the interior. (Bull. Geol. Soc., Am., 1892, p. 173).